

NAME .....

TEACHER/SECTION .....

DATE .....

# Investigating Food Webs with Owl Pellets

## Objectives

- *Dissect an owl pellet.*
- *Identify prey species using a dichotomous key.*
- *Construct a rodent skeleton from recovered skeletal prey.*
- *Construct a food web based upon pellet prey analysis.*
- *Interpret owl prey data from graphs.*

## Safety & Disposal

Be sure to follow your teacher's directions.

The owl pellets in this kit have been heat-sterilized for safety purposes. However it is advisable that you wear gloves when handling pellet material and skeletal remains. Do not touch your hands to your face when working with pellet material.

Always wash your hands before leaving the laboratory. Dispose of any waste materials at the end of the investigation as directed by your teacher.

## Background

### Owls and Owl Pellets:

Owls are "predators" and "raptors". As predators, they seek out other animals—their prey—to catch and eat. As raptors, owls and other birds, such as hawks and eagles, catch their prey with the long claws or talons, on their feet. Eagles and hawks hunt during the day and use their sharp beaks to tear meat from their prey. Owls, on the other hand, hunt at night and swallow their prey whole.

In addition to seeing as well as other raptors, owls have an unusual hearing ability that allows them to locate their prey through their movements. Both their hearing and sight capabilities are due to the presence of facial disks—specially arranged feathers around each eye that form depression-shaped funnels which channel light and sound.

An owl is a formidable hunter. In addition to visual acuity and excellent hearing, owls possess other special features. Their beaks are designed not to tear and rip flesh, like other raptors, but to kill prey by crushing. Additionally, the leading edge an owl's wings include thousands of tiny feathers called "serrations". Together, these serrations function as "vortex dampers" which channel and dampen wind currents to prevent high-pitched "whistling" usually associated with flight. This attribute cloaks the owl's approach, meaning that most prey never hear their hunter.

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The Barn Owl (*Tyto alba*) is a medium-sized owl whose range extends virtually around the world, with the exception of deserts and arctic tundra. It nests in a variety of locales ranging from church steeples and caves to silos and hollow trees. Barn owls typically feed on various rodents; larger mammals, such as rabbits; insects, including grasshoppers and beetles; and small birds such as blackbirds.

After an owl swallows its prey, head first, digestive enzymes in the glandular stomach attack the meat for digestion. Bones and hair are not affected by the digestive process and, therefore, must be eliminated from the

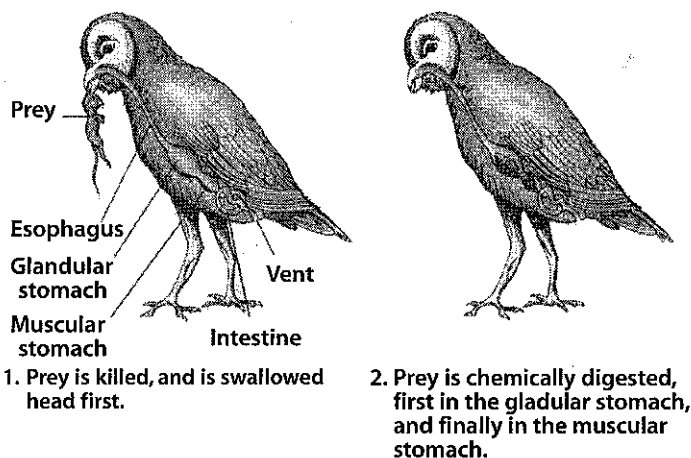
owl's body. Here the muscular stomach plays an intricate role by pressing undigested hair against bones to form a hair and bone package, called an "owl pellet". This pellet is expelled from the owl's body through the mouth in a process called "regurgitation".

An owl pellet usually contains the remains of more than one captured prey animal. Scientists take advantage of this physiological characteristic of regurgitation by studying owl pellets to find out more about predator-prey relationships.

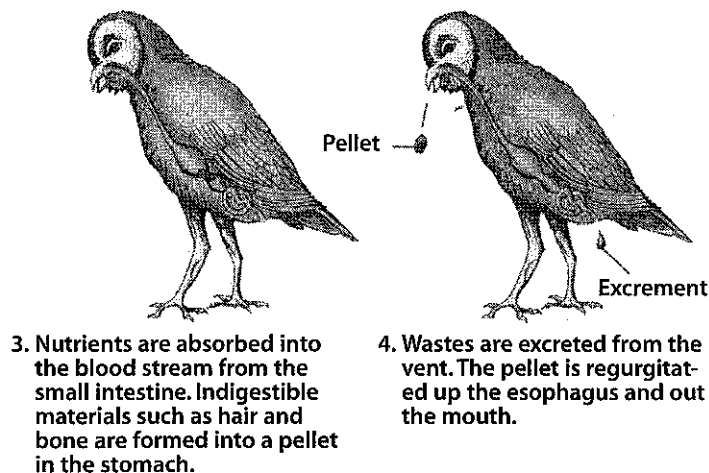
## Who Eats Whom:

All organisms are "biochemical machines" which are powered by energy captured from the sun through photosynthesis. Ecologists assign every organism in an ecosystem to a "trophic level" based upon what it eats. The organisms which first capture the sun's energy are called "producers" which make energy-storing molecules. Producers include plants, some types of protists and bacteria. All other organisms in an ecosystem are "consumers", which obtain the sun's energy by consuming producers. A special class of consumers which obtain their energy from the organic wastes and dead bodies of all other organisms are "decomposers". A graphic representation of this "who eats whom" relationship is called a "food chain": The sum of these interconnecting networks of food chains is a "food web"—a graphic picture of how energy and materials move through a community.

In this investigation you will dissect an owl pellet and recover as many prey remains as possible. You will then use a dichotomous or "two-answer" key to identify prey animals. Then, you will calculate the "biomass requirements" for the "population" of owls studied by the class and determine the prey diet of these owls. Finally, you will construct a food web that illustrates the predator-prey relationship.



## OWL PELLET FORMATION



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